Motivation for Air-Launch: Past, Present, and Future

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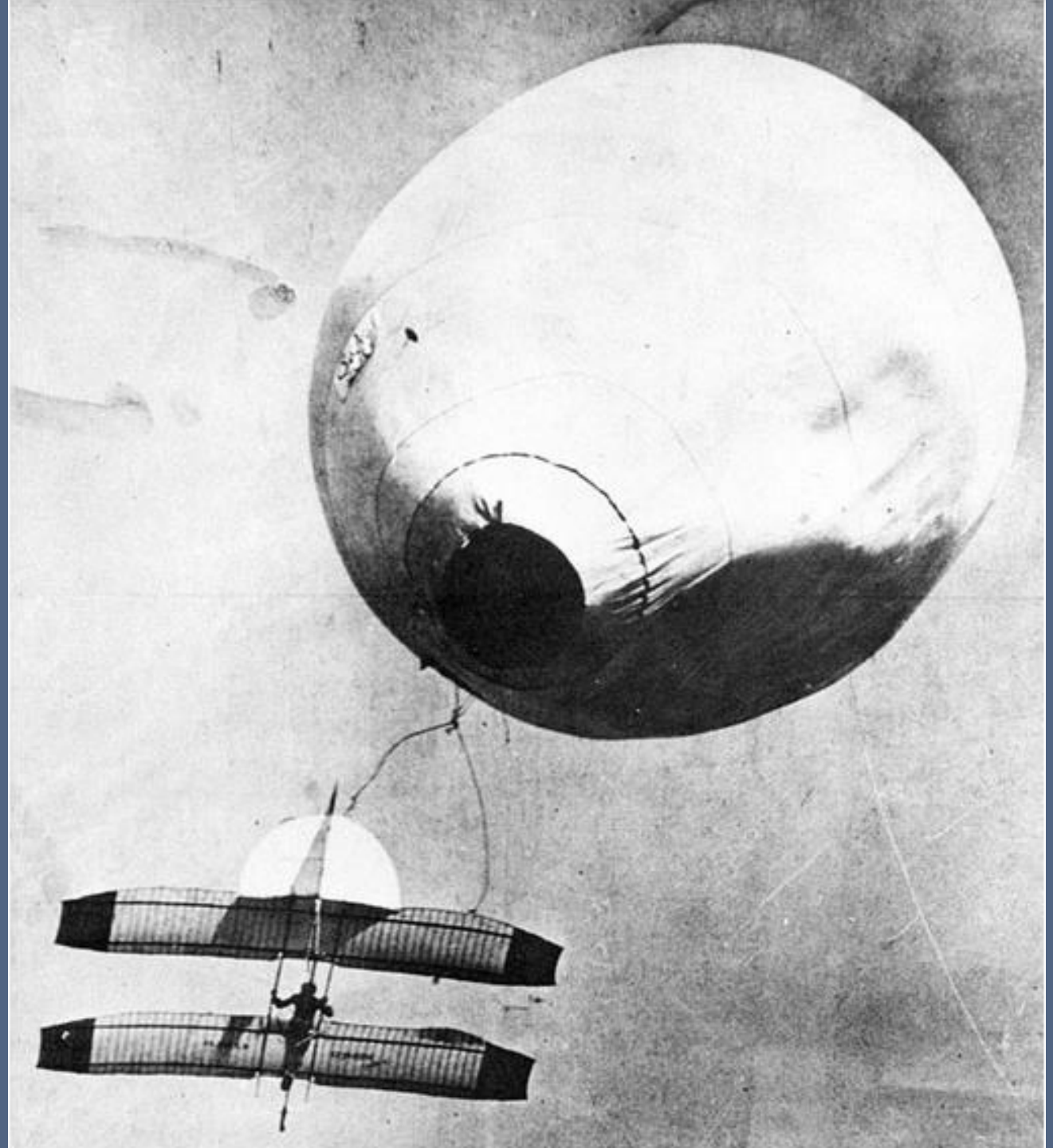
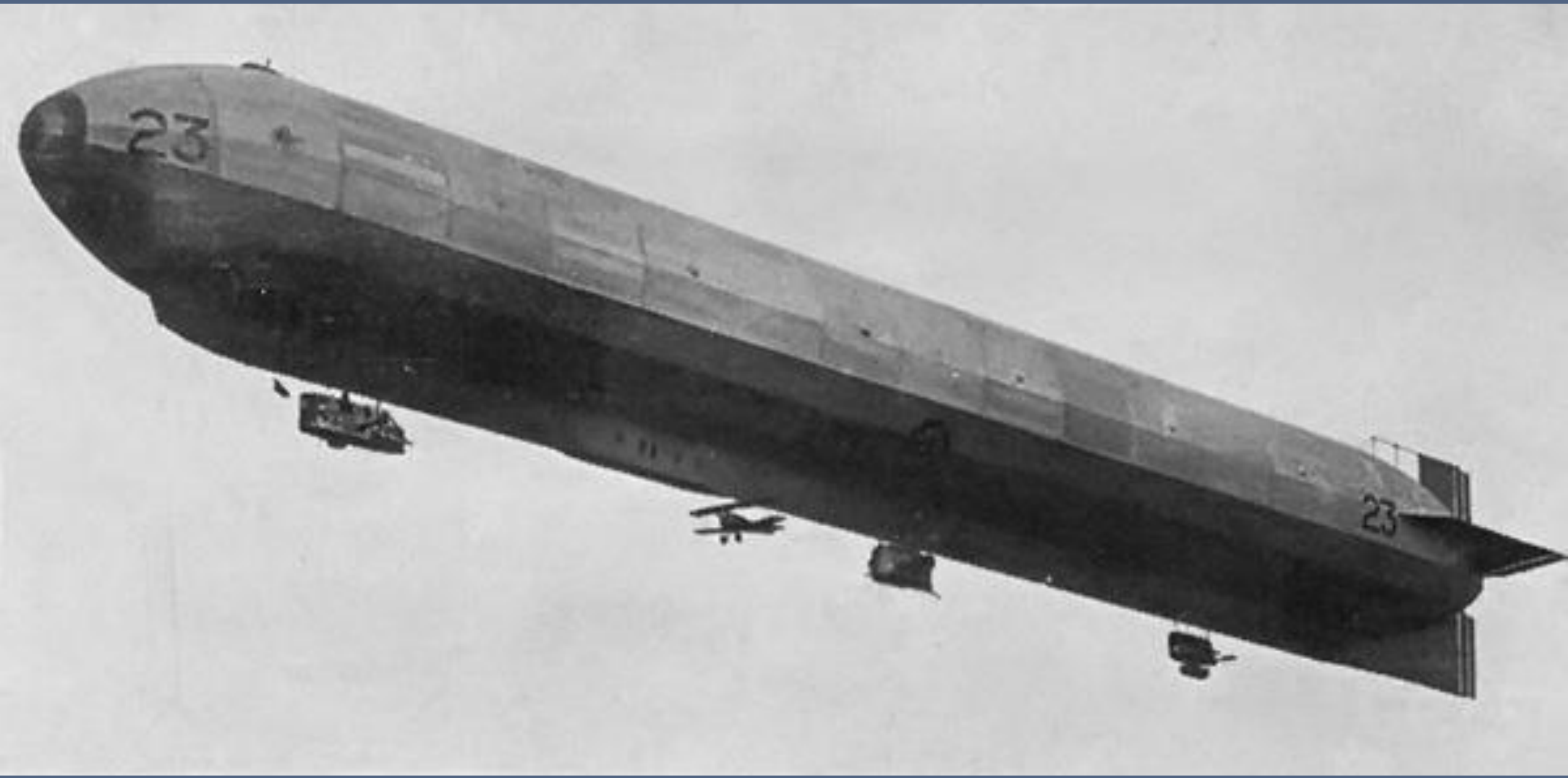
“Air-Launch,” as defined for this paper …

- *two or more air-vehicles* joined and working together, that eventually separate in flight, and that have a combined performance greater than the sum of the individual parts.*

  - The definition of “air-vehicles” includes, but is not limited to: airplanes (powered and unpowered), airships, blimps, balloons, space launch vehicles, and munitions, so long as those munitions are integrated into a guided air-vehicle. This definition of air-launch specifically excludes release of unguided munitions (i.e., dumb bombs dropped from an aircraft).

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U.S. ARMY TC-5
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1436 FIRST CONTACT EVER ESTABLISHED BETWEEN AIRPLANE AND AIRSHIP IN FLIGHT, AT LANGLEY FIELD, VA.
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U.S.NAVY

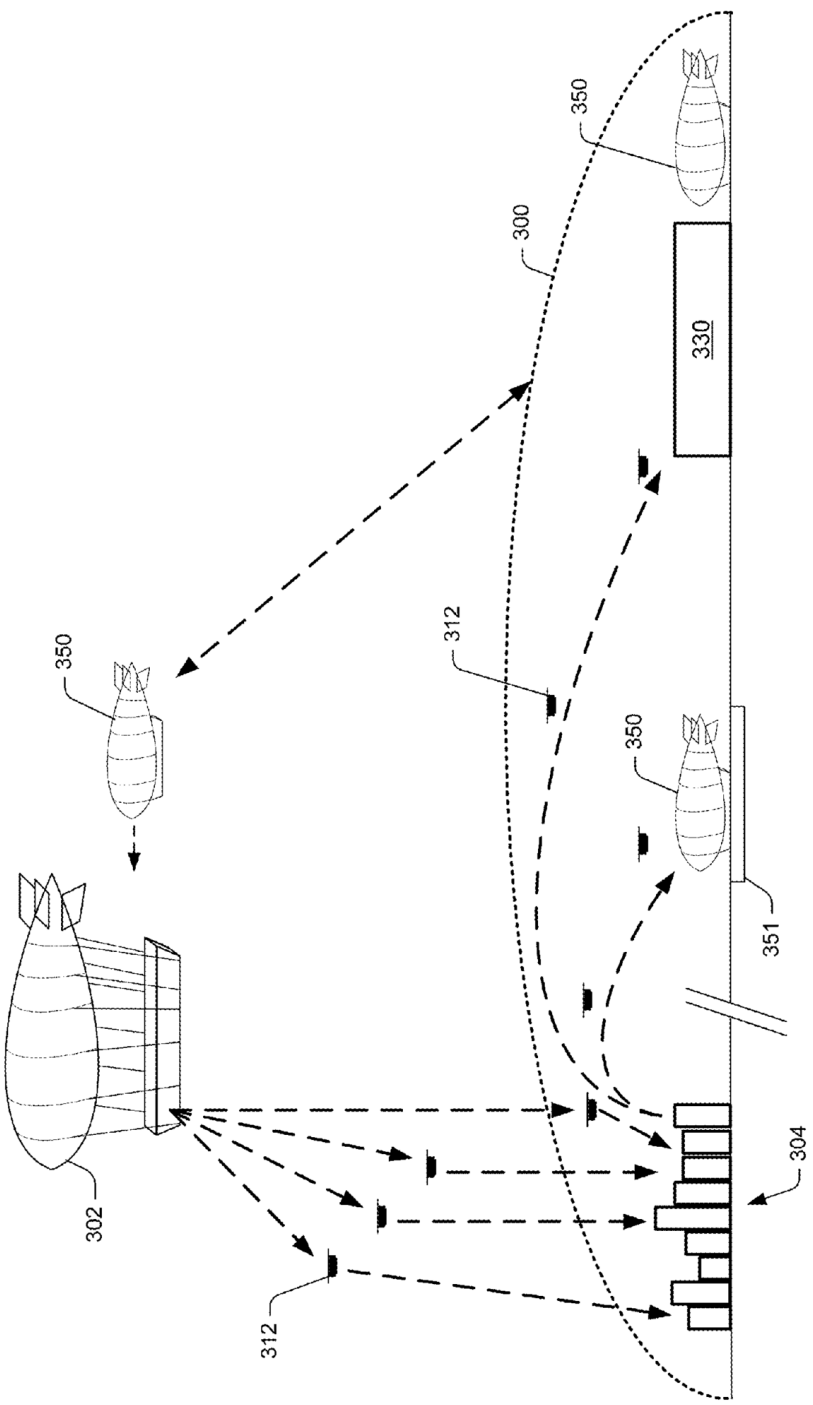


FIG. 3


CURTISS GLIDER
5822-3

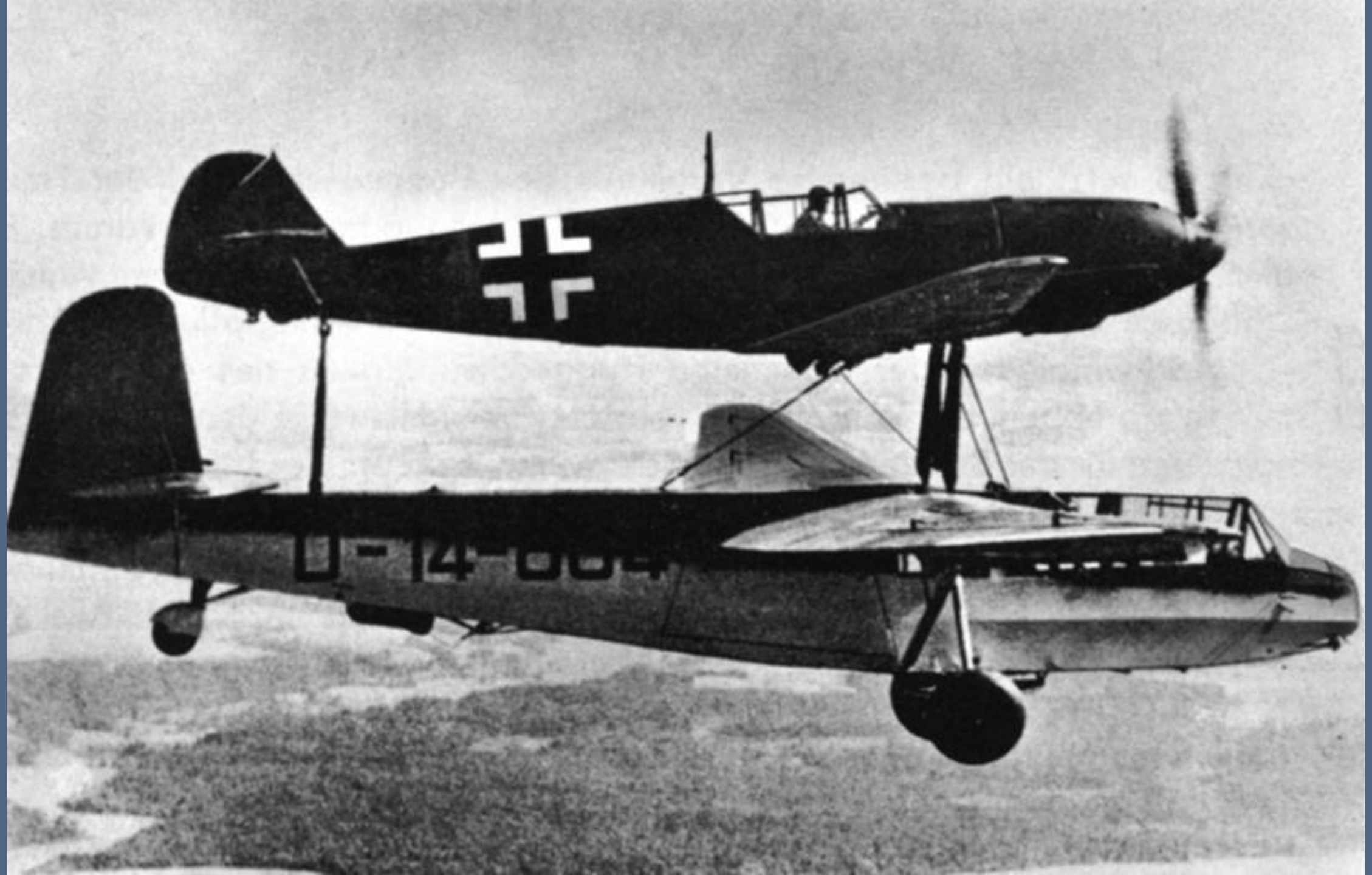

CURTISS GLIDER
5822-4

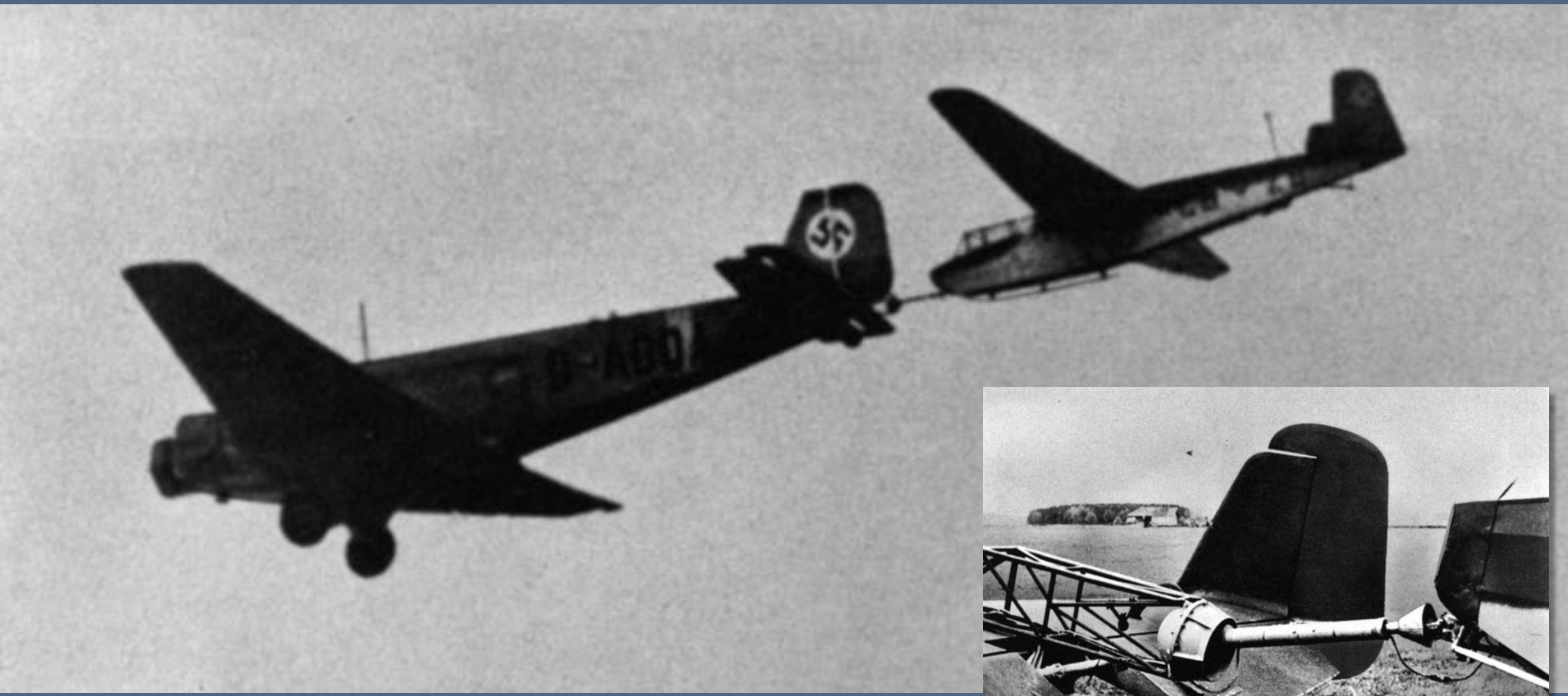

195169
339953

Bundesarchiv, Bild 1011-567-1519-18
Foto: Stöcker | 1943

The Gliders of WWII:

Nation	Approximate Number Produced during WWII
Germany	4000
Britain	2200, plus 740 CG-4s imported from the U.S.
Japan	800
Soviet Union	400
United States	16,000

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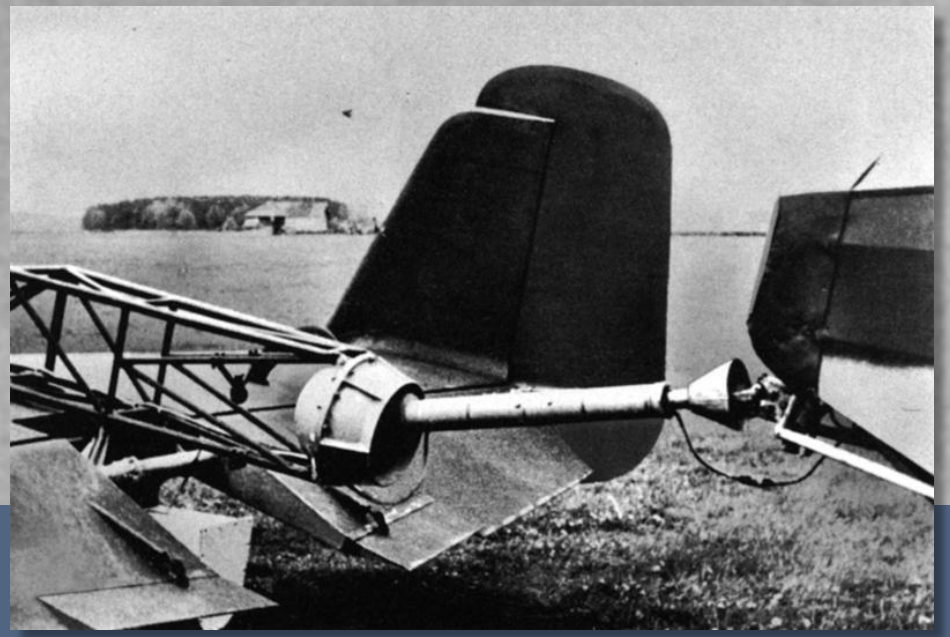

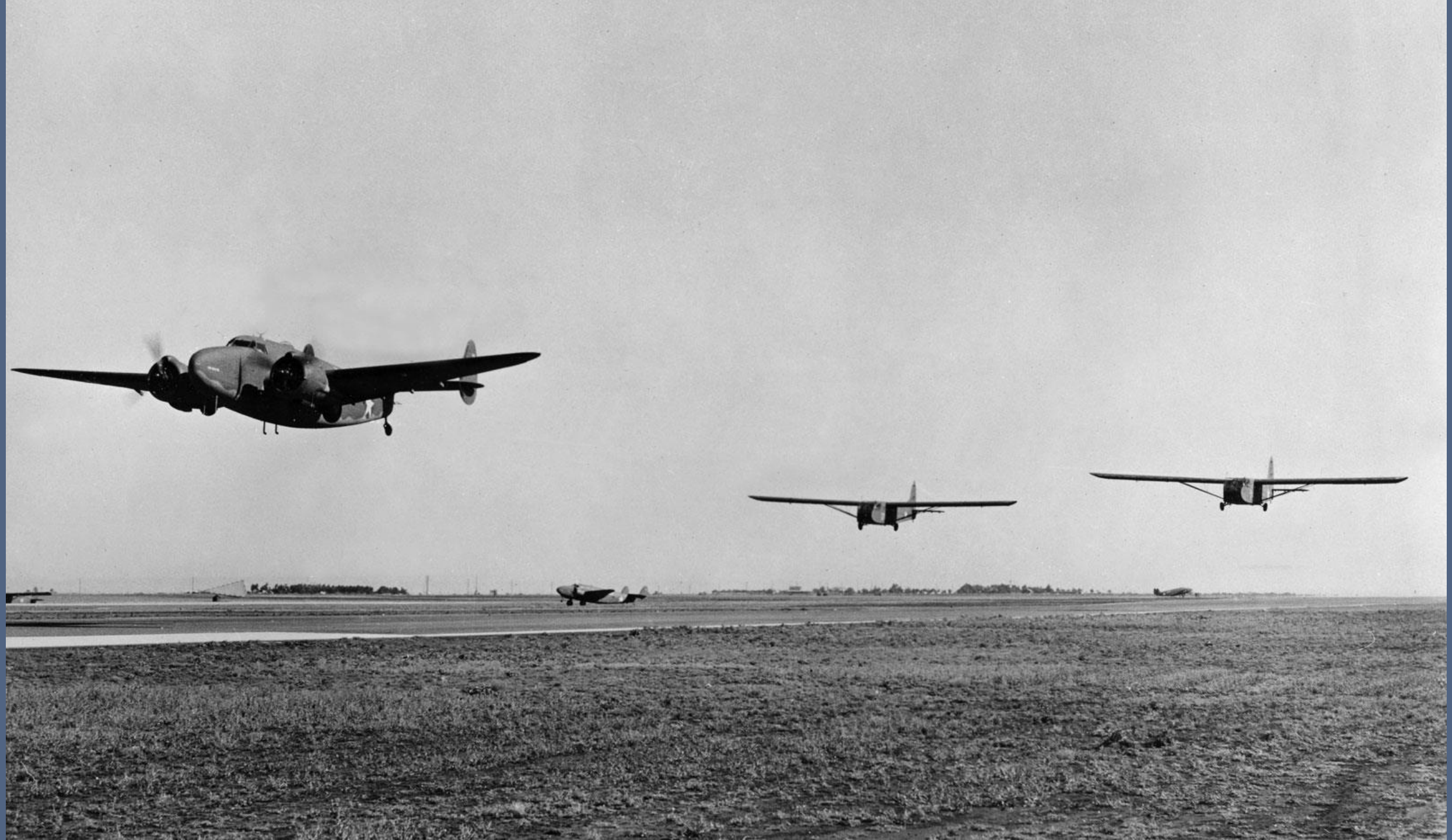

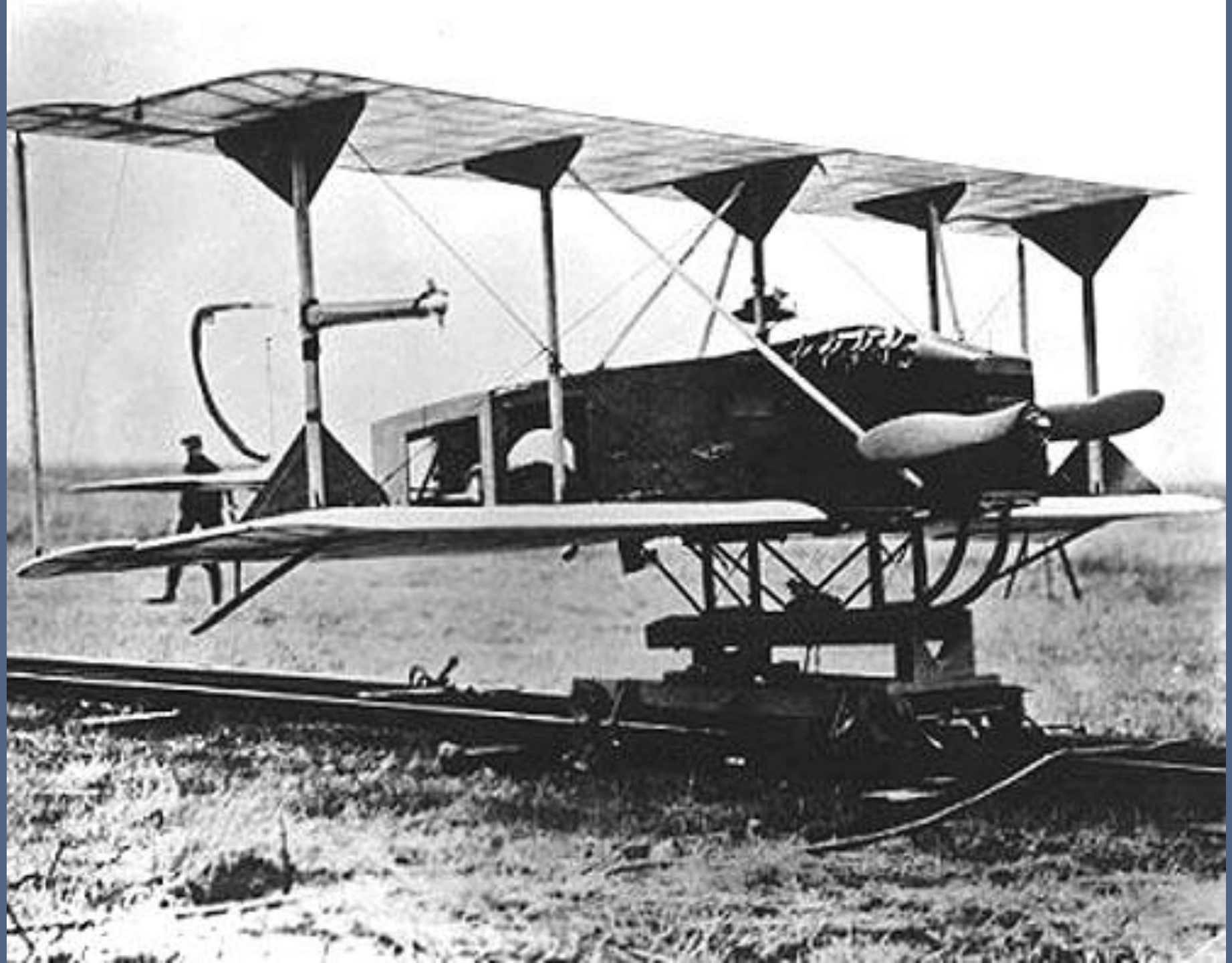

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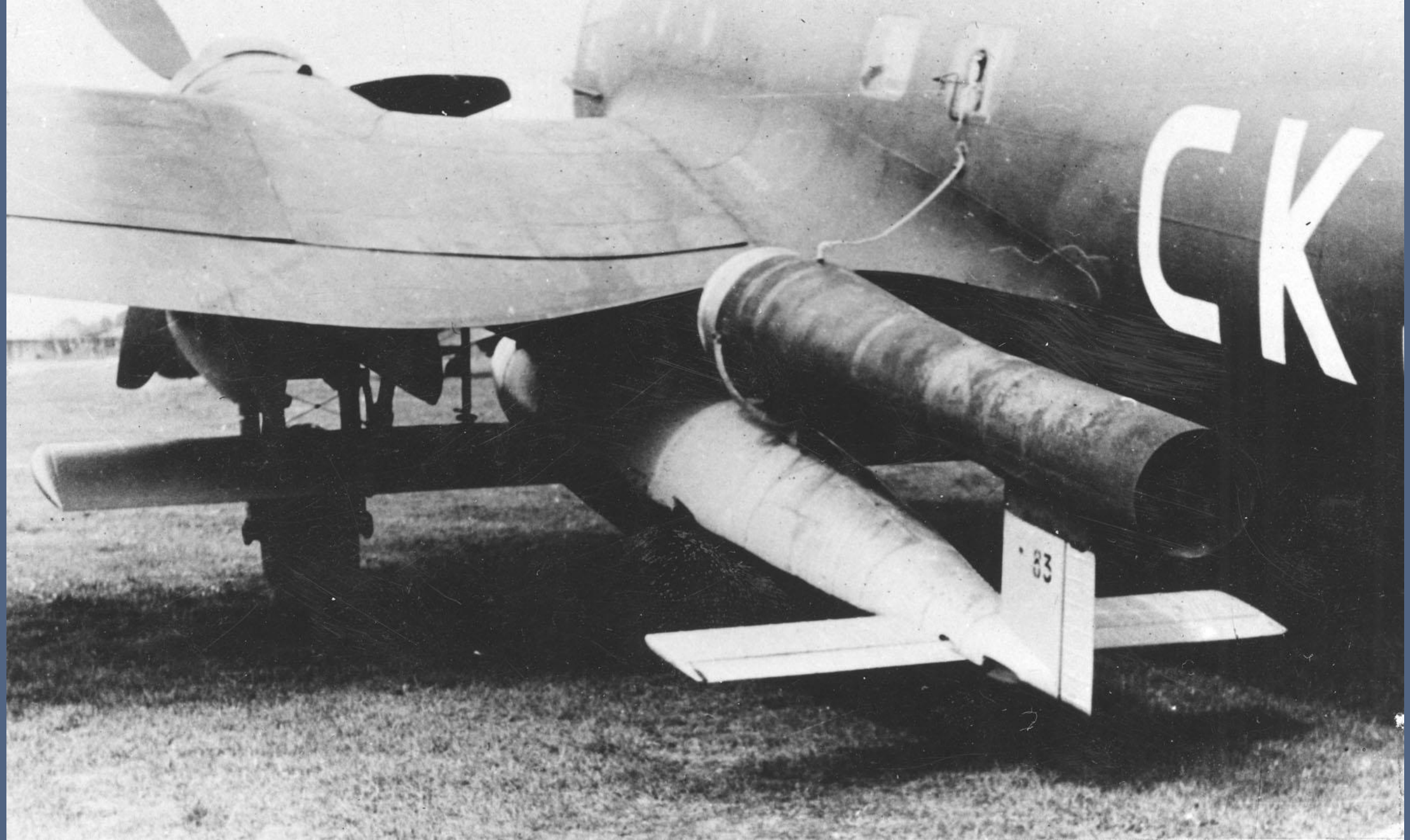
Foto: Lysiak | 1944/1945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GERMAN "PICK-A-BACK"


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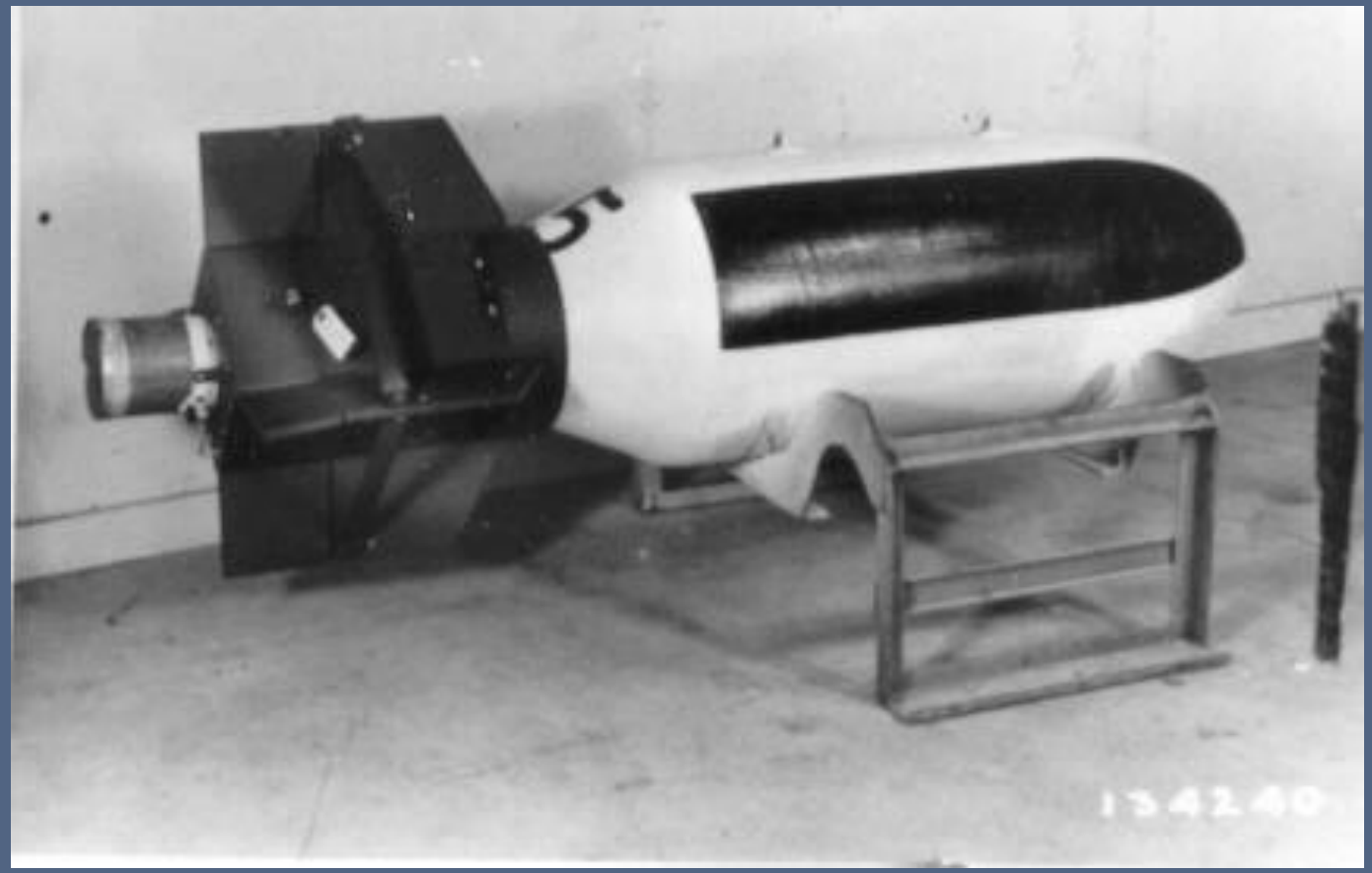
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USAF
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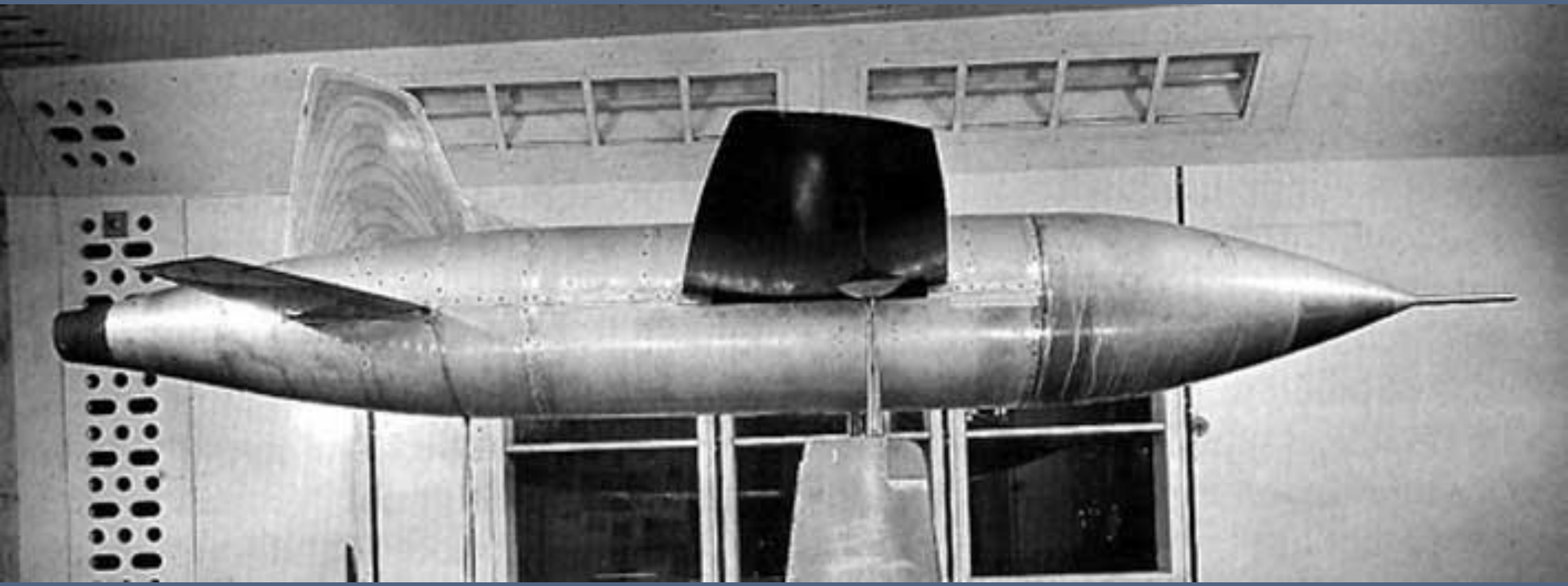
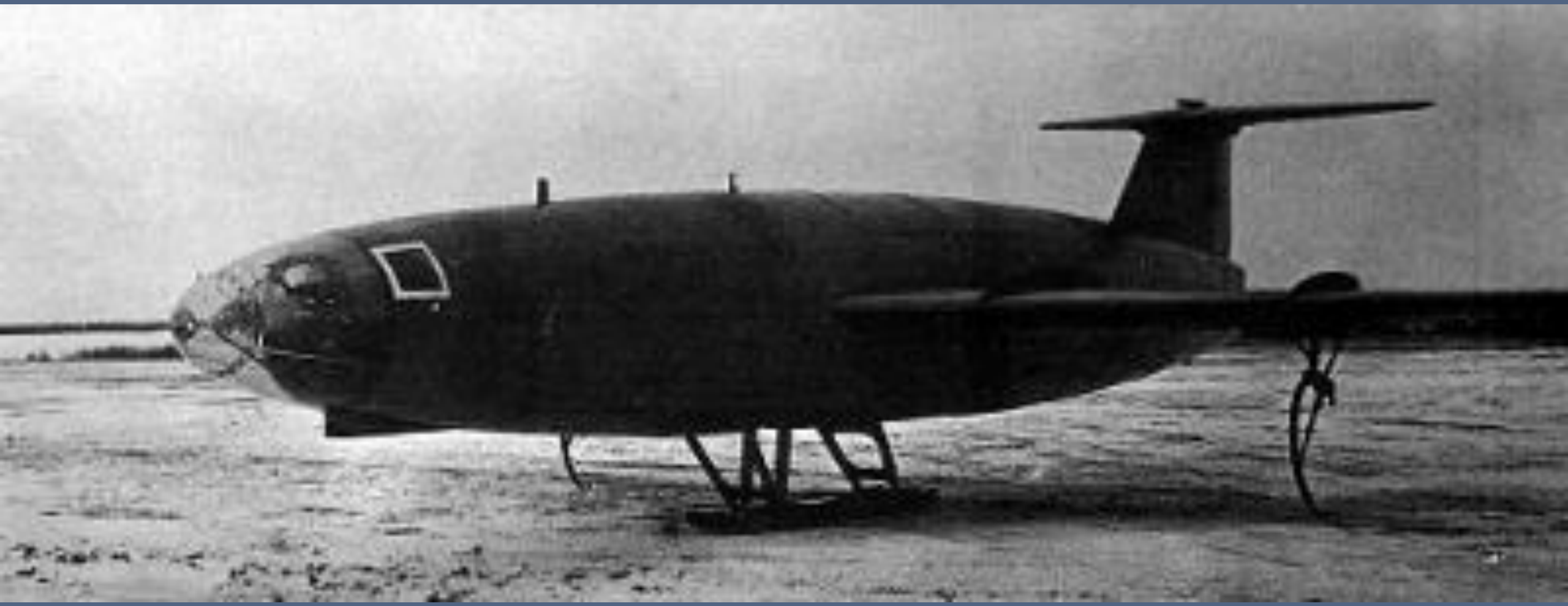
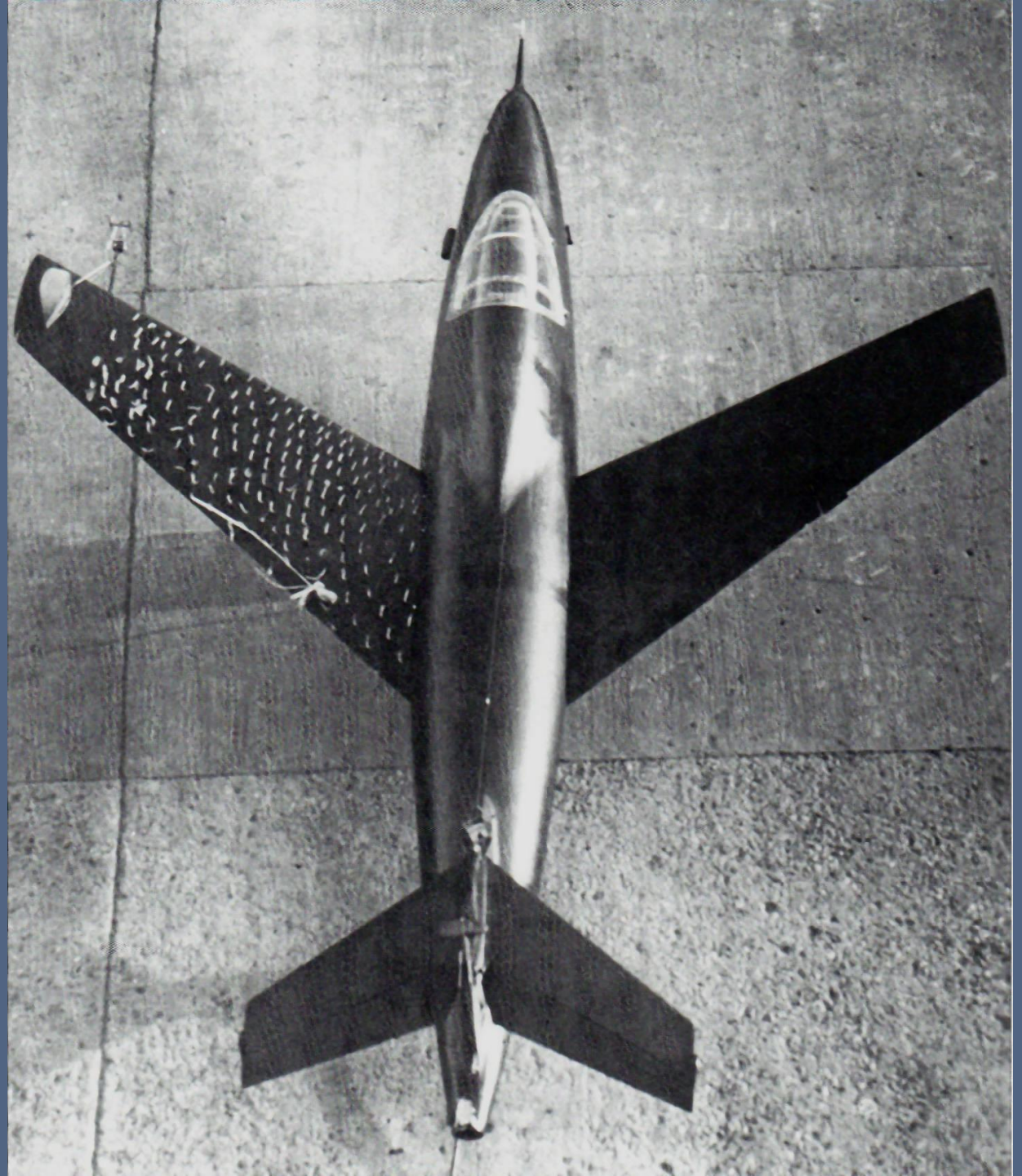
BEWARE OF BLAST

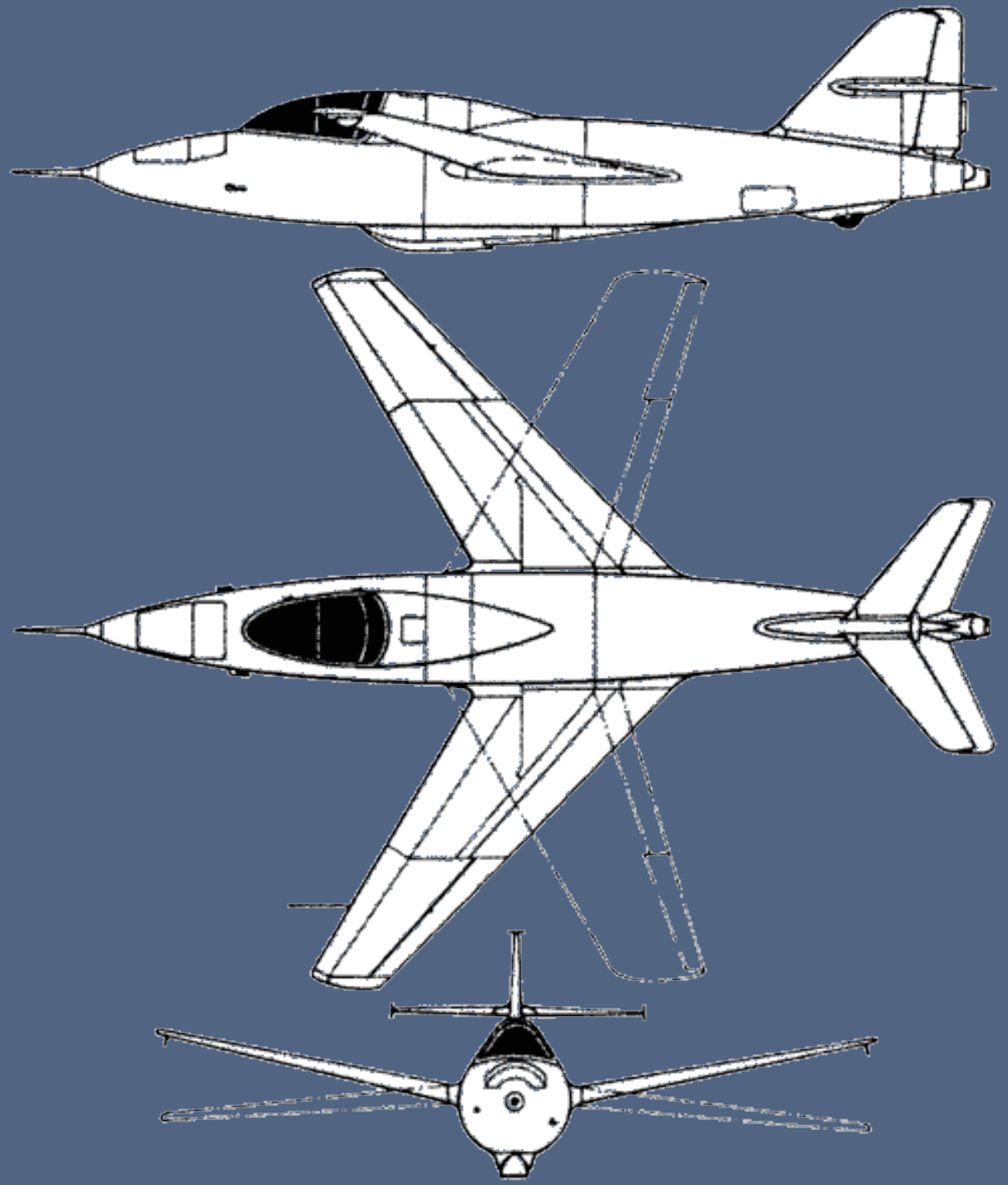

Hyper-X
DRYDEN
FLIGHT RESEARCH
CENTER
NASA




René Leduc
Jean Villey
LEDUC 010





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United States


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United States


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CAUTION


NASA
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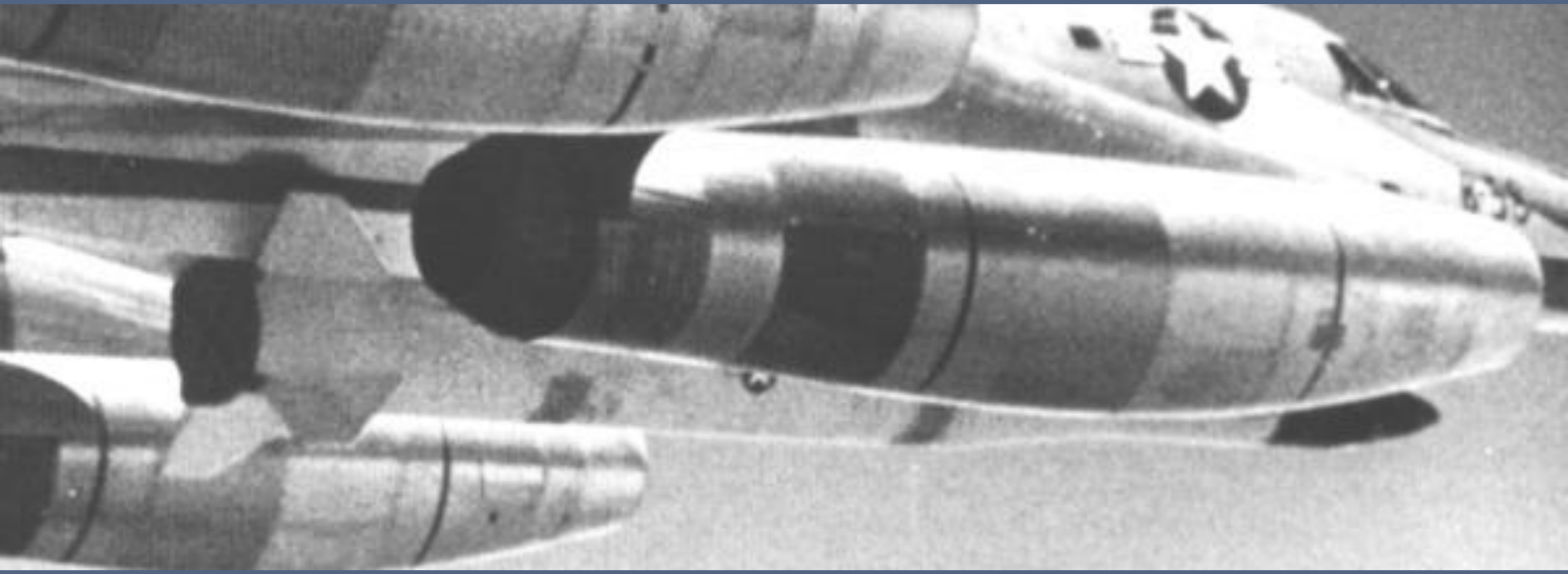
FC-749
U.S. AIR FORCE

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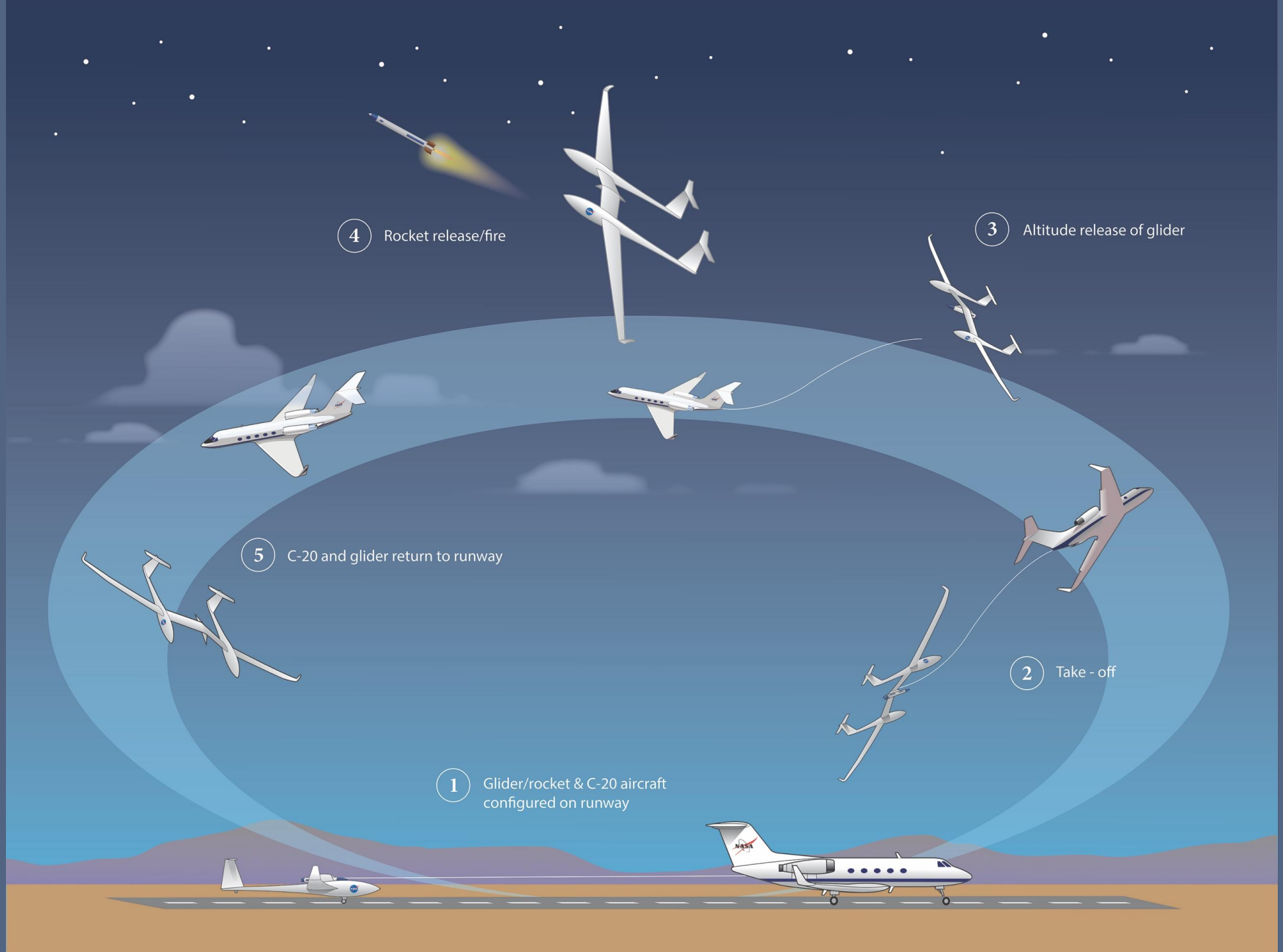
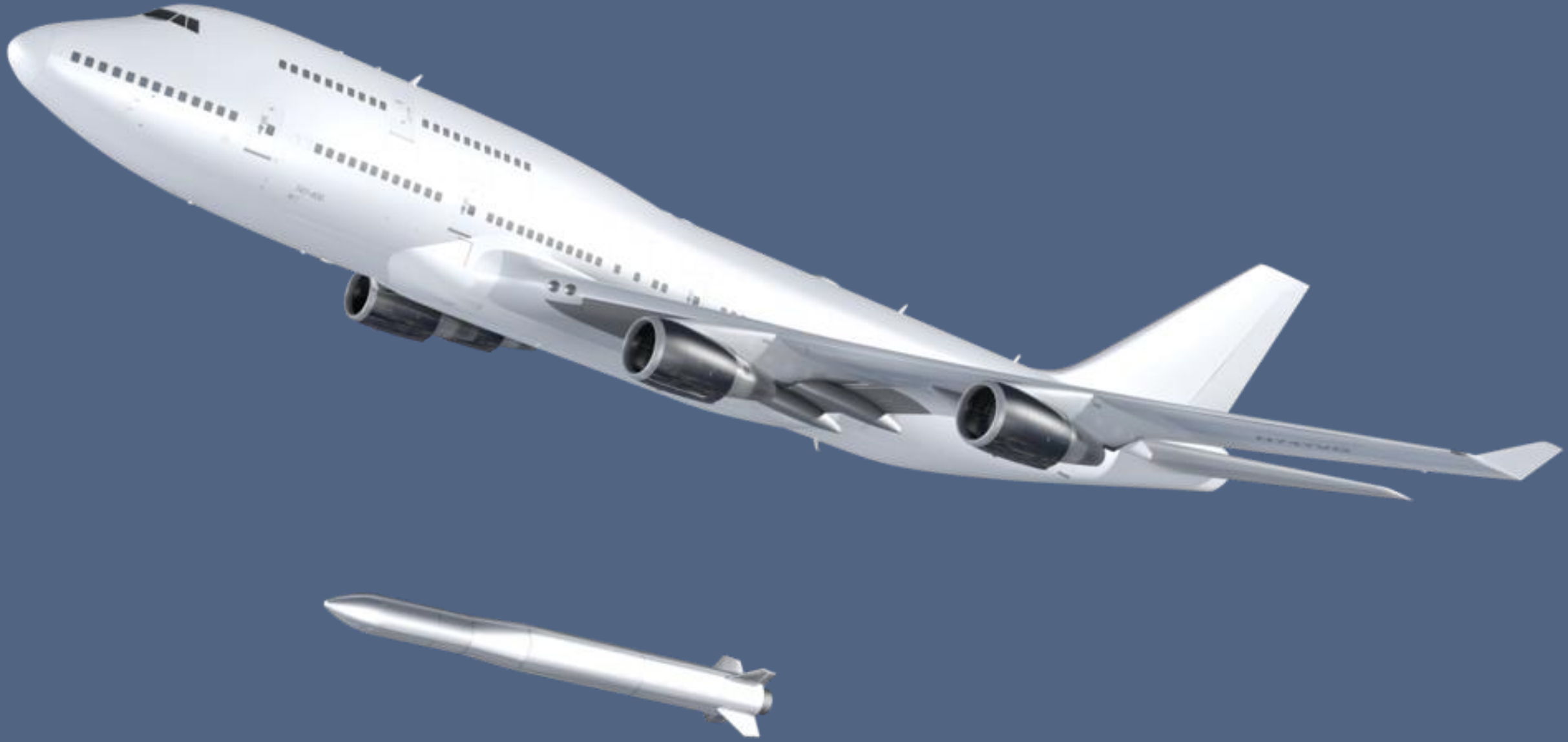
Orbital ATK
STARGAZER

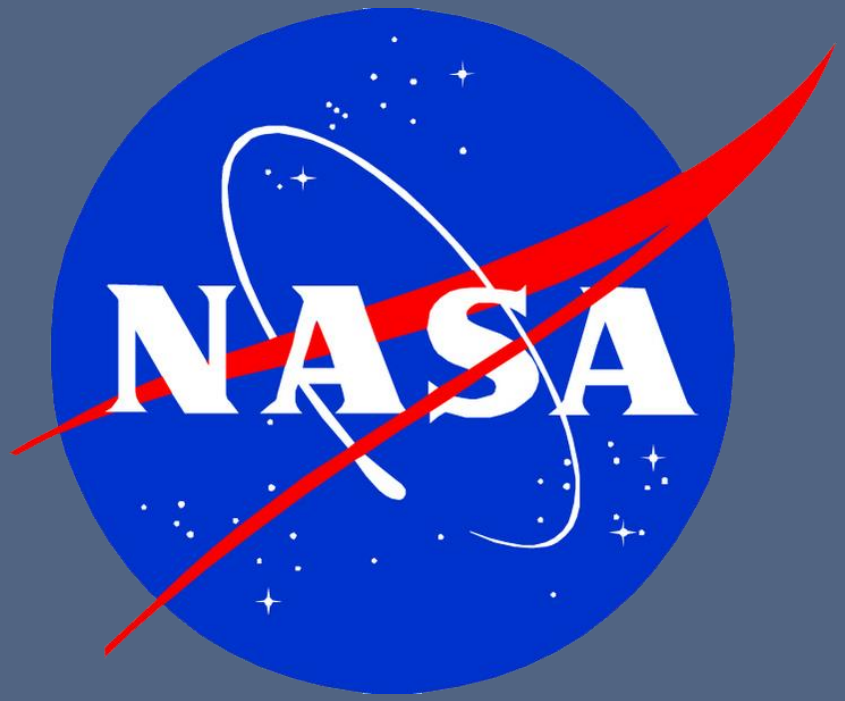

4 Rocket release/fire
3 Altitude release of glider
5 C-20 and glider return to runway
2 Take - off
1 Glider/rocket & C-20 aircraft configured on runway


N318SL


N318SL
BOEING


SCALED COMPOSITES
GALACTIC

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